

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

Independent claims 1, 13 and 22 have been amended to clarify that a timing at which a measured value having a largest change of measured light quantity value between two adjacent sampling points in a vicinity of a specified timing is measured, is detected as a start timing at which a measurement of a head part of the gradation pattern has actually been started, based on measured values measured at the fixed interval timing, wherein the specified timing is prescribed in advance as a timing at which the measurement of the head part of the gradation pattern is started, and wherein a shift between the specified timing and the start timing is detected as the shift of the measurement timing. See the disclosure in, for example, Fig. 8 and the corresponding disclosure in the specification.

In addition, independent claims 3, 14 and 24 have been amended to clarify that a timing at which a measured value near to an intermediate light quantity value of measured values in a vicinity of a specified timing is measured, is detected as a start timing at which a measurement of a head part of the gradation pattern has actually been started, based on measured

values measured at the fixed interval timing, wherein the specified timing is prescribed in advance as a timing at which the measurement of the head part of the gradation pattern is started, and wherein a shift between the specified timing and the start timing is detected as the shift of the measurement timing. See the disclosure in, for example, Fig. 11 and the corresponding disclosure in the specification.

Still further, independent claim 3 has been amended to recite "An image forming apparatus..." as required by the Examiner on page 2 of the Office Action.

Yet still further, claims 13 and 14 have both been amended at lines 29-30 thereof to recite "the measurement results" (plural) in order to properly refer back to "measurement results" recited on the respective line 11 thereof.

Claims 2, 15-21, 23 and 34-39, moreover, have been canceled without prejudice.

No new matter has been added, and it is respectfully requested that the amendments to the claims be approved and entered.

RE: DUPLICATE CLAIMS

In item 3 on page 3 of the Office Action, the Examiner advised that if claims 1, 3, 22 and 24 were found to be allowable, claims 13, 14, 34 and 35 will be objected to under

37 CFR 1.75 as being substantial duplicates thereof, respectively.

Claims 34 and 35 have now been canceled, thereby rendering moot the Examiner's potential objection under 37 CFR 1.75 of claims 34 and 35. With respect to the Examiner's potential objection to claims 13 and 14, for the reasons set forth in detail hereinbelow, the potential objection is respectfully traversed.

According to the present invention as recited in each of independent claims 1 and 3, an imaging forming apparatus comprises a gradation correcting unit for correcting the gradations of the output image, based on a measurement result of the measured reflected light quantity of the correcting image. With this structure of the present invention as recited in independent claims 1 and 3, a measurement result (singular) corresponding to a gradation density step in a gradation pattern may be used for correcting gradations of the output image. For example, as disclosed in Fig. 8 and page 58, lines 12-22 in the specification, a measurement result corresponding to "P+3" is used for the density step 5 for correcting gradations of the output image. See also, Fig. 7.

By contrast, according to the present invention as recited in each of independent claims 13 and 14, an image forming apparatus comprises a gradation correcting unit for correcting

the gradations of the output image, based on measurement results of the measured reflected light quantities of the correcting image. With this structure of the present invention as recited in independent claims 13 and 14, measurement results (plural) corresponding to a gradation density step in a gradation pattern may be used for correcting gradations of the output image. For example, as disclosed in Fig. 8 and page 58, lines 12-22 in the specification, measurement results corresponding to both "P+3" and "P+4" are used for the density step 5 for correcting gradations of the output image. See also, Fig. 4D and 7.

According to MPEP 706.03(k), "court decisions have confirmed applicant's right to restate (i.e., by plural claiming) the invention in a reasonable number of ways. Indeed, a mere difference in scope between claims has been held to be enough" (emphasis added).

Accordingly, contrary to the Examiner's assertion on page 3 of the Office Action, it is respectfully submitted that claims 13 and 14 are not duplicates of claims 1 and 3. And therefore, it is respectfully requested that the potential objection to claims 13 and 14 under 37 CFR 1.75 be withdrawn.

THE PRIOR ART REJECTION

Claims 1, 3-9, 11-14, 22, 24-30 and 32-35 were rejected under 35 USC 103 as being obvious in view of the combination of

USP 6,462,838 ("Hirata et al"), USP 5,754,920 ("Tanaka et al") and USP 5,600,404 ("Ando et al"); and claims 10 and 31 were rejected under 35 USC 103 as being obvious in view of the combination of Hirata et al, Tanaka et al, Ando et al and USP 6,898,381 ("Maebashi et al"). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

Re: Independent claims 1, 13 and 22

Significantly, according to the present invention as recited in amended independent claims 1, 13 and 22, an image forming apparatus and a method thereof are provided whereby a timing at which a measured value having a largest change of measured light quantity value between two adjacent sampling points in a vicinity of a specified timing is measured, is detected as a start timing at which a measurement of a head part of the gradation pattern has actually been started, based on measured values measured at the fixed interval timing, wherein the specified timing is prescribed in advance as a timing at which the measurement of the head part of the gradation pattern is started, and wherein a shift between the specified timing and the start timing is detected as the shift of the measurement timing.

On page 5 of the Office Action, the Examiner agrees that Hirata et al does not disclose or suggest the features of the

timing correcting unit (claim 1) of the present invention. For this reason, the Examiner has cited Tanaka et al.

In particular, according to the Examiner on page 5 of the Office Action, the element A7 in Fig. 9b of Tanaka et al corresponds to the "specified timing" as recited in the claimed present invention. Applicant respectfully disagrees, and submits that the correction method of the measurement timing of Tanaka et al does not correspond to that of the claimed present invention.

According to the claimed present invention, the specified timing is prescribed in advance irrespective of measurement values. By contrast, if the element A7 in Fig. 9b of Tanaka et al is considered to correspond to the "specified timing" as asserted by the Examiner, it is respectfully submitted that the specified timing of Tanaka et al is not prescribed in advance. Indeed, the element A7 in Fig. 9b of Tanaka et al does not correspond to the specified timing prescribed in advance as according to the claimed present invention.

Further, according to Tanaka et al, the change in detection values between the detection value V_1 at the first sampling point A1 and the detection values V_n at other sampling points A_n , i.e. $|V_1 - V_2|$, $|V_1 - V_3|$, . . . , $|V_1 - V_{nmax}|$ are determined. And in Tanaka et al, when an absolute value of the change in detection values exceeds a predetermined first reference value (e.g. $|V_1 - V_8| >$ "first reference value"), the sampling point (A7) at which the

pattern detection has actually been started is recognized for correction of measurement timing. See Fig. 10 and the corresponding disclosure in the specification of Tanaka et al.

That is, Tanaka et al merely calculates differences between the measurement value at the first sampling point and the measurement values at the other sampling points, and merely compares the differences with a predetermined reference value to recognize the start timing at which the measurement of the pattern has actually been started. (Fig. 10 of Tanaka et al.) It is respectfully submitted that with this structure and method of Tanaka et al, it is difficult to set the predetermined reference value to perform accurate and reliable recognition of the start timing at which the measurement of the pattern has actually been started when there are different kinds of density patterns (that is, different gradations in gradation patterns). That is, with the structure of Tanaka et al, if the predetermined reference value thereof is too large, the start timing cannot be accurately detected, and if the predetermined reference value is too small, noise may be detected at start timing.

By contrast, according to present invention as recited in amended independent claims 1, 13 and 22, a timing at which a measured value having a largest change of measured light quantity value between two adjacent sampling points in a vicinity of a specified timing is measured, is detected as a start timing at

which a measurement of a head part of the gradation pattern has actually been started. With this structure of the present invention as recited in amended independent claims 1, 13 and 22, the start timing is determined without referring to any predetermined reference value. And as a result, an advantageous effect is produced whereby the start timing at which the measurement of the head part of the gradation pattern has actually been started is reliably detected and the detection is less affected by the noise because according to the claimed present invention, the start timing is not based on any predetermined reference value. That is, with the structure of the claimed present invention, an advantageous effect is produced whereby even when there are different kinds of density patterns on the correcting image (different gradations in gradation patterns), the start timing of the different kinds of density patterns are accurately and reliably detected (that is, the shifting of the measurement timing may be performed even when a value is less than a reference value).

It is respectfully submitted that even if all of Hirata et al, Tanaka et al and Ando et al were combinable in the manner suggested by the Examiner, any such combination would still not achieve or render obvious the above described advantageous effect produced by the structure and method of the present invention as recited in amended independent claims 1, 13 and 22 whereby a

timing at which a measured value having a largest change of measured light quantity value between two adjacent sampling points in a vicinity of a specified timing is measured, is detected as a start timing at which a measurement of a head part of the gradation pattern has actually been started, based on measured values measured at the fixed interval timing, wherein the specified timing is prescribed in advance as a timing at which the measurement of the head part of the gradation pattern is started, and wherein a shift between the specified timing and the start timing is detected as the shift of the measurement timing.

Re: Independent Claims 3, 14 and 24

According to the present invention as recited in amended independent claims 3, 14 and 24, an image forming apparatus and method are provided whereby a timing at which a measured value near to an intermediate light quantity value of measured values in a vicinity of a specified timing is measured, is detected as a start timing at which a measurement of a head part of the gradation pattern has actually been started, based on measured values measured at the fixed interval timing, wherein the specified timing is prescribed in advance as a timing at which the measurement of the head part of the gradation pattern is started, and wherein a shift between the specified timing and the start timing is detected as the shift of the measurement timing.

For the reasons set forth hereinabove in connection with the patentability of the claims 1, 13 and 22, it is again respectfully submitted that contrary to the Examiner's assertions on pages 5 and 9 of the Office Action, the element A7 in Fig. 9b of Tanaka et al does not correspond to the specified timing prescribed in advance as according to the claimed present invention.

In addition, since according to amended independent claims 3, 14 and 24, the start timing at which a measurement of a head part of the gradation pattern has actually been started is detected based on a timing at which a measured value near to an intermediate light quantity value of measured values in a vicinity of a specified timing is measured, the start timing is determined without referring to any predetermined reference value. As a result, an advantageous effect is achieved whereby the start timing is reliably detected and the detection is less affected by noise. That is, with the structure and method of the present invention as recited in claims 3, 14 and 24, even when there are different kinds of density patterns on the correcting image (different gradations in gradation patterns), the advantageous effect of accurately and reliably detecting the start timing of the different kinds of density patterns is produced (that is, contrary to Fig. 10 of Tanaka et al, the shifting of the measurement timing may be performed even when a value is less than a reference value).

It is respectfully submitted that even if all of Hirata et al, Tanaka et al and Ando et al were combinable in the manner suggested by the Examiner, any such combination would still not achieve or render obvious the above described advantageous effect produced by the structure and method of the present invention as recited in amended independent claims 3, 14 and 24 whereby a timing at which a measured value near to an intermediate light quantity value of measured values in a vicinity of a specified timing is measured, is detected as a start timing at which a measurement of a head part of the gradation pattern has actually been started, based on measured values measured at the fixed interval timing, wherein the specified timing is prescribed in advance as a timing at which the measurement of the head part of the gradation pattern is started, and wherein a shift between the specified timing and the start timing is detected as the shift of the measurement timing.

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In view of the foregoing, it is respectfully submitted that amended independent claims 1, 3, 13, 14, 22 and 24, as well as claims 4-12 and 25-33 respectively depending therefrom, all patentably distinguish over the cited prior art references, taken singly or in any combination, under 35 USC 103.

Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

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